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ECONOMIC VALUE OF NORTH AMERICAN SKUNKS

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ONCE generally despised, sometimes with a bounty offered for its destruction, and under the ban of both farmer and sportsman, the skunk now has become a recognized asset of the communities it inhabits.

The skunk indirectly conserves the food supply by preying upon insects and other enemies of crops, and the excellent fur it produces offers a valuable material for warm winter garments. Among fur animals it is second in importance in the United States, the muskrat alone exceeding it in total value of fur produced.

Skunks are kept and reared easily in captivity, and under intelligent management may become a source of profit, although thus far those who have made money in raising them have sold the animals chiefly for breeding purposes. Further experiment will be required to decide whether they can be made profitable as fur producers in captivity. That skunks may become interesting as pets is shown in the title-page illustration.

This bulletin discusses the habits and economic importance of the skunk, and furnishes ample instructions to those who desire to raise the animals in inclosures. It is for general distribution.

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ABOUT twenty States now have laws protecting skunks by a close season. These laws were passed in response to the wishes of farmers who recognize the usefulness of these animals in destroying noxious insects and to the demands of persons interested in conserving the fur resources of the country. A fuller understanding of the economic value of these creatures would no doubt result in protective measures in all the States.

Several causes have contributed to the present scarcity of fur animals. The increased demand for furs and their consequent high prices have led to close trapping; but the extension of farming, the reclamation of swamps, and the thinning out of forests have, by restricting the range of the fur bearers, effected what hunting and trapping alone could not have accomplished. The time is near at hand when the supply of pelts will be so far short of the demand that a further marked advance in prices will follow. Its effect on the wild life of forests and streams can readily be foreseen, and the problem of conserving the remnant of the fur supply and supplementing it from other sources becomes one of vital importance.

The three fur animals still fairly abundant in the United States are the muskrat, the mink, and the skunk. Of these the muskrat is most likely to retain its numbers, since it multiplies rapidly and, properly protected, is in no danger of extinction except where swamps are drained for agriculture. The mink breeds but once a year, and close trapping has already made it scarce over wide areas. Its choice of banks of streams and marsh lands as a habitat aids in its preservation, but unless given more adequate protection it can not long survive the high premium on its pelt. The skunk, although not yet in danger of extinction, is likely soon to be even more closely trapped, as its pelt has great intrinsic value and the demand for it has

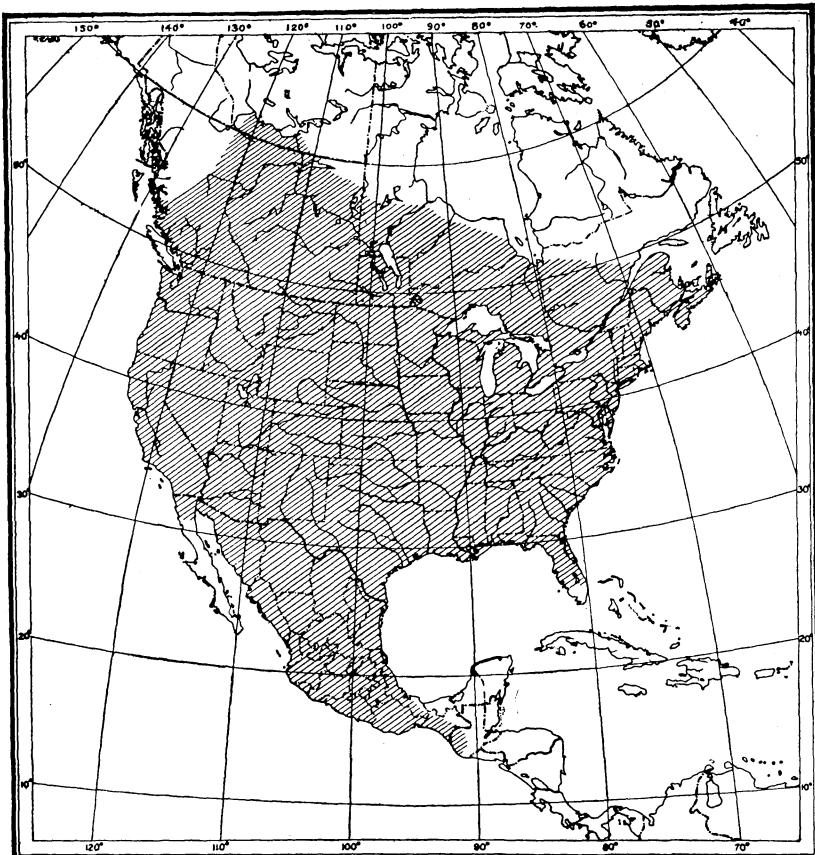


FIG. 1.—Range of common skunk (*Mephitis*).

not yet fully developed. Within a few years the prices of this fur will probably be more than doubled.

The three fur animals named are economically the most important ones, because each is widely distributed and adapted to a variety of climatic conditions. If, as is believed, they can be domesticated or successfully reared in captivity, their breeding may become a means of profit in most parts of the United States. The skunk, especially, presents possibilities of widely extended usefulness in domestication.

KINDS OF SKUNKS.

The common large skunks¹ are restricted wholly to North America. They range northward to Nova Scotia, the Hudson Bay country, and British Columbia; and southward through the greater part of Mexico, including part of Lower California, to Guatemala (fig. 1). The number of species recognized is 9, with 8 subspecies, or geographic races.

¹ Genus *Mephitis*.

Fifteen of the forms occur within the United States. As these species and races are not separately recognized in the fur trade, they will not be so considered here. In general, the more northern forms have the finer fur; but in the fur trade the pelts are graded according to the amount of white in the pelage. In the best grade, No. 1, are placed those in which there is no white or in which the white areas do not extend much beyond the head and neck of the animal. No. 2 skins, or "short stripe," are those in which the white area does not extend beyond the middle of the body. No. 3 skins have long narrow stripes, while No. 4 are broad-striped (fig. 2). The skins are further graded in price according to the locality from which they were obtained. Northern skins are more valuable because the pelage is finer, and the black color more intense than those from southern localities.

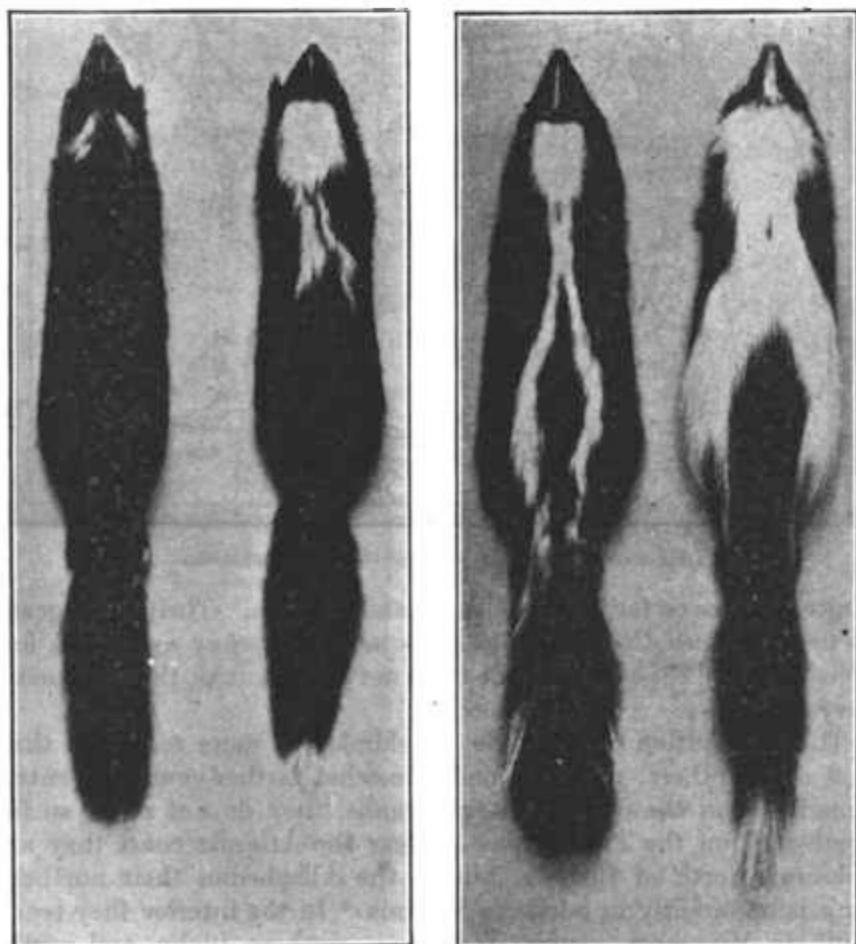


FIG. 2.—The four grades of skunk fur.

The four grades of skunk fur are due to individual variation in markings, and none of them is entirely characteristic of any particular species. An apparent exception may be found in the plains skunk¹ and its races. Most of these are characterized by long narrow stripes, but because of their extra size they are more valuable than ordinary No. 3 skins.

A skunk belonging mainly to Central and South America² differs from the common skunks of the United States in having a relatively shorter tail and the back broadly marked with white from the crown of the head to the end of the tail. Three forms are found within the

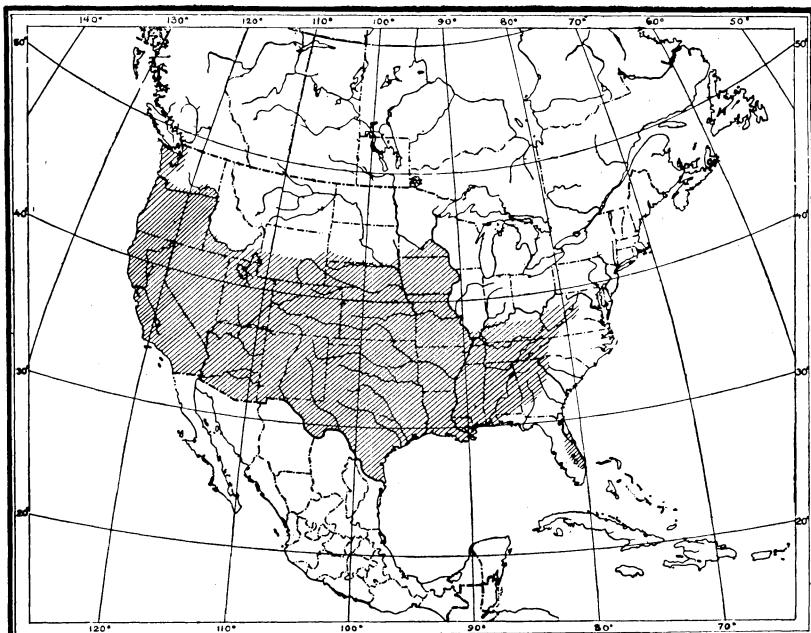


FIG. 3.—Range of spotted skunks (*Spilogale*) north of Mexico.

United States as far north as Texas and Arizona. Their skins grade as broad-striped (No. 4), and as the pelts are heavy and much less densely furred than those of the more northern skunks, they command very low prices.

The distribution of little spotted skunks³ is more restricted than that of the others. While found somewhat farther south in Central America than the common large skunks, they do not range so far northward on the Pacific coast. Near the Atlantic coast they are unknown north of Georgia, but in the Alleghenies their northern limit is apparently in northern Virginia. In the interior they reach southern Minnesota, central Wyoming, southern Idaho, and south-

¹ *Mephitis mesomelas*.

² Genus *Conepatus*.

³ Genus *Spilogale*.

eastern Washington. On the coast they are found from southern British Columbia to Lower California (fig. 3).

Fourteen species and six races of little spotted skunks are known, 13 of the 20 forms occurring within the United States. These animals are considerably smaller than the other skunks. The total lengths of species in the United States vary in average from 320 to 560 millimeters (12.6 to 22.4 inches). The pygmy spotted skunk of Mexico is the smallest skunk known, the only specimen in the collection of the Biological Survey measuring but 9.4 inches in total length.

Spotted skunks, like the common large skunks, vary much in the amount of white in the fur as well as in the pattern of the spots or short stripes. The skin is strong and the pelage good in the more northern forms, but because of the small size and many white spots the fur is not very valuable. In the fur trade the skins are known as "civet," and, dressed in the natural color, they are now much in vogue for garments.

GENERAL HABITS OF SKUNKS.

Skunks are mainly terrestrial. The little spotted skunks occasionally voluntarily climb trees in search of food, but the larger forms apparently do not climb unless driven to do so. None of the skunks swim unless forced into deep water, but all are fond of bathing in shallow ponds or streams. They have plantigrade feet and well-developed claws, especially in front. The white-backed skunks of Central and South America are more given to digging than the others, and in general outline, shape of nose, and strong development of claws, they much resemble badgers, the only other group of the musteline family that have the feet better adapted for digging.

While skunks often dig dens in ordinary soils, they much prefer to use natural cavities in rocks or burrows dug by other animals, as the fox, badger, and woodchuck. They are said sometimes to attack and kill the woodchuck before taking its burrow. Fallen logs, recesses under stone walls or fences, and cavities under tree roots furnish the skunk convenient retreats. If the floor of a building is near the ground, the space below is often used by the animals. Also, they nest under well covers, board walks, hay scales, and stacks, as well as in culverts, covered drains, abandoned cellars, and caves for storing vegetables. In winter the warmth of the floors of occupied dwellings or country schoolhouses seems to be especially attractive to them; and the animals often take up their abode in carelessly filled trenches conveying steam pipes from boilers to distant buildings, no doubt attracted by the warmth.

When skunks dig their own dens the burrows are seldom very long or deep. They go down below the ordinary frost line, and after a

short lateral gallery, end in a rounded chamber containing the nest, a bed of leaves or dried grasses. Occasionally there are two entrances to a den.

In northern latitudes skunks lie housed in their dens during the coldest part of winter, but in mild weather they move about freely in search of food. Usually a considerable number occupy the same den, possibly members of a single family of the preceding summer, but sometimes the number seems too great to be only one family. As many as 20 have been captured at one time from a single den in winter.¹ When thus disturbed skunks are found lively enough to prove that hibernation is not complete. As spring approaches the animals mate, and the pairs betake themselves to separate establishments. In the South this gregarious habit is not so marked, although the young usually remain with the mother until mating time in late winter.

Skunks are mainly nocturnal, but when not harassed by enemies they often hunt in broad daylight. They usually come out about sunset and spend the summer twilight in catching grasshoppers and beetles by springing upon them with the fore feet as the insects rise from the ground in flight. After dark the skunk depends upon its senses of smell and hearing to locate its prey. It digs many beetles and their larvæ from the ground, leaving the surface thickly pitted with small conical holes where the insects were obtained.

SCENT GLANDS.

Skunks, in common with other members of the musteline family, have glands which secrete an extremely nauseous fluid. These consist of two oval sacs, located just beneath the skin below the base of the tail, one on each side; they are covered by muscular envelopes and open to the surface through ducts, one leading from each sac.

When the animal is on the defensive it elevates its tail and by contracting the muscles about the glands ejects the fluid through the ducts in two tiny streams of spray. A large, vigorous animal has been known to throw the fluid nearly a rod, but the ordinary distance is from 6 to 10 feet. The liquid is sufficiently acrid to cause nausea, and, if it strikes the eyes, to produce temporary blindness. Skunks use this peculiar and effective means of defense only when attacked or badly frightened.

The persistence of skunk odor in anything touched by the fluid is remarkable. Clothing after contact with it is sometimes entirely ruined. Washing in chloride of lime or gasoline will remove the odor from one's hands, but chloride of lime will spoil the colors of most fabrics. Probably the best plan for removing the odor from garments is to wash them in gasoline or benzine and then to expose

¹ Forest and Stream, XII, 1879, p. 365.

them to the action of sun and wind; another is to bury the garment for several days in moist soil; still another, to immerse it for a time in flowing water.

BREEDING HABITS.

Skunks breed usually but once a year. The larger skunks mate early in spring (February and March) and the young, numbering from 6 to 12 in a litter, are born in May. They are blind and nearly hairless at birth and do not open their eyes until about three or four weeks old. Soon after this they begin to follow the mother about and continue with her until almost fully grown. They are mature when about six months old and breed the following spring.

The breeding habits of little spotted skunks differ but little from those of the larger animals. They mate a little later in the spring and the litters seldom exceed six in number. On July 10, 1905, at Apache, Okla., the writer found a litter of six young with eyes not yet open. They were well covered with soft hair and had the characteristic markings of adult animals.

FOOD OF SKUNKS.

The belief that skunks feed mainly upon birds and birds' eggs is so general that statements to the contrary are often challenged. While the animals occasionally eat wild birds and poultry, the evidence furnished by stomach examinations is overwhelmingly favorable to skunks, and proves that on the whole they are beneficial. Scientific observers since the days of Audubon have nearly all testified to the usefulness of these animals, but popular prejudices are hard to overcome.

The Biological Survey has records of the contents of 62 skunk stomachs examined by its field men. Of these stomachs, 37 were of common skunks, 9 of white-backed skunks, and 16 of little spotted skunks. As the food of these differs but slightly, they may be treated together.

Grasshoppers and crickets formed a large percentage of the food of nearly half the skunks examined. Beetles and their larvæ formed the most important item of food, being found in nearly two-thirds of the stomachs and in many instances being the sole diet. Fifteen animals had eaten injurious rodents, such as mice, rats, ground squirrels, and pocket gophers, while 3 had eaten carrion; 3 had taken lizards or salamanders; 3, crawfish; 2, fungi; 2, earthworms; and 6, berries or other fruit. In one stomach the feathers of a bird were found, and in another, that of an animal trapped in a henhouse, parts of a domestic fowl. Two stomachs contained centipedes; 1, sawflies; 1, cicadas only, and another the pulpy stems of a succulent plant.

The 62 stomachs were of animals captured in every month of the year. While the number for some months is very small, analysis of results proves that skunks ordinarily eat food that is abundant and easily obtained. When insects are plentiful, these constitute the whole diet; when they are scarce, the food is of greater variety. Thus skunks taken from January to March had eaten small mammals, lizards, crawfish, earthworms, fungi, and a few beetles. The diet in April and May was mainly beetles, a small mammal being the only exception. In June, in every instance, there was an unmixed diet either of beetles, grasshoppers, or cicadas. Eight of 14 skunks taken in July had eaten insects exclusively. In August and September grasshoppers formed the chief diet, but a few beetles also were found. For the last three months of the year the insect diet was varied with other animal food, while berries were prominent in a few cases.

Insects eaten by the skunk seem to be mostly of injurious kinds, and the usefulness of this animal is more apparent when there is an invasion of large numbers of some insect pest, as grasshoppers, crickets, cicadas, army worms, or the like. An instance of this was observed in 1913 by E. R. Kalmbach, of this bureau, in northern New Mexico during an invasion of the range caterpillar. Skunks were abundant, and investigation showed that from 60 to 95 per cent of their food was made up of the pupal cases of these insects. On large areas skunks had taken the majority of the pupæ.

SKUNKS AND POULTRY.

The chief indictment against the skunk is that it destroys poultry, and a few cases of serious losses due to the animal are reported. In many instances of alleged depredations by skunks, it is probable that minks or weasels were the actual culprits, and that skunks merely shared in the plunder by eating the dead poultry. When a farmer loses fowls and does not see the animal killing them he is often likely to mistake its identity. The common skunk can not climb to a roost, and would kill only birds found on the ground. Minks and weasels are expert climbers and are far more bloodthirsty. It is characteristic of the weasel to kill many victims when they are within reach. It makes a small but deep incision in the neck or under the wing of a fowl and takes the blood as long as it flows freely. It then attacks and kills another and another victim, until satisfied. Minks also kill a number of chickens at one visit to the coop, eating only the heads. A skunk, on the contrary, usually takes only one fowl at a time and eats of it until satisfied. Having once, however, acquired a taste for chicken, a skunk will return to the poultry yard night after night for a fresh victim.

A skunk making its home under sheds and other buildings roams about them at night in search of food, chiefly rats, mice, and insects. That it should occasionally learn to take chickens and eggs is not

surprising, but this happens far less frequently than might be expected. It is a habit learned by very few individuals and not a characteristic of skunks as a family. The writer visited a skunk yard in Ohio where chicks about the size of quail were eating from the same pans with the skunks. The owner stated that this occurred daily and that the skunks had never molested the chicks. Much testimony could be cited showing that skunks frequently feed with poultry in hen-houses without molesting the fowls. Of course, the individual skunk that learns to kill and eat chickens should be destroyed.

SKUNKS AND GAME.

Persons interested in the preservation of game often denounce the skunk, asserting that it destroys pheasants, quail, grouse, and other game; and sportsmen's clubs usually encourage the destruction of skunks, classing them with foxes, minks, and weasels as enemies of game. Sometimes side hunts are arranged for the destruction of "vermin," and in some places bounties are paid for killing these animals. So far as skunks are concerned, there is little evidence that they often disturb game.

The late Byron Andrews, of Erwin, S. Dak., informed the writer that he once found a pinnated-grouse nest containing eggs about to hatch less than 4 rods from a den which had long been in use by skunks. Mr. Andrews argued that the skunks surely would have destroyed this nest had they been fond of eggs.

The writer has repeatedly known quails to nest and hatch out broods within a few rods of a skunk den. A few eggs from one nest were eaten by crows, but a large clutch was left to hatch. The truth is that at the season when the native game birds are nesting skunks have abundant insect food, and by the time this food fails the birds are strong of wing and seldom fall a prey to this mammal.

SKUNKS AND BEES.

The destruction of yellow jackets and bumblebees by skunks has often been noted. It is generally supposed that the juicy larvæ of these insects are most appreciated, but the adults also are eaten, and probably the honey stored by the bumblebees.

Complaints of the destruction of bees in their hives by skunks have been recorded. The skunk approaches the apiary cautiously and scratches on the outside of a hive until the bees rush from the entrance to repel the intruder. The skunk shows much skill in capturing the insects and in dislodging them from his long hair, where many cling. He pays little attention to their stings. One or two visits to a hive are said to suffice nearly to destroy the colony. The possibility of skunks attacking an apiary may be entirely avoided by placing the hives upon a high bench.

BENEFICIAL HABITS OF SKUNKS.

The skunk feeds mainly upon insects, but its economic status can not be fixed by this habit alone. This must rest on the character of the insects eaten. Not all insects are injurious, as certain kinds themselves feed upon injurious species and are therefore highly beneficial. The skunk is one of the most important mammals in its choice of harmful insects for its diet.

SKUNKS AND ARMY WORMS.

The skunk is the best-known mammal enemy of army worms. The common army worm, the wheat-head army worm, and the fall army worm are all very destructive to small grains, corn, and grasses, and their invasions entail heavy losses among farmers. The good work of skunks in destroying army worms has frequently been noticed. In a report on this insect in Pennsylvania, published in 1896, Dr. B. H. Warren brought forward much testimony of farmers as to the usefulness of skunks in the work of extermination.¹ Also, he had examined three skunk stomachs which contained chiefly beetles and army worms. Prof. Lugger of Minnesota² also mentioned the skunk as one of the principal enemies of the army worm in that State.

SKUNKS AND TOBACCO WORMS.

Skunks are fond of the insects known as tobacco worms. Two species of these larvæ very destructive to tobacco and tomato plants are the southern tobacco worm and the northern tobacco worm. Both species occur over wide areas in the United States, and in sections where no tobacco is grown they feed upon tomato and potato plants. While the worms are active skunks gather them from the plants, and when the worms go into the ground in the latter part of summer, the animals dig out pupæ in great numbers. The evidence of this is found in numerous small pits bearing marks of the skunks' claws. The mature moths, as well as the larvæ and pupæ, are eaten by skunks.

SKUNKS AND WHITE GRUBS.

The larvæ of scarabæid beetles are known generally as white grubs, and among them number some very destructive insects. The larvæ of "June bugs," or "May beetles," infest grass lands and feed upon the roots of grasses and other plants. They are among the chief enemies of the strawberry, and also seriously affect the potato, gnawing the tubers and often making large portions of the crop unfit for sale.

Skunks are very fond of these white grubs and spend much time digging for them. Strawberry growers recognize the usefulness of

¹ Annual Report of Pennsylvania State College, 1896, pp. 164-220.

² Bull. 48, Minn. Agr. Exp. Sta., 1896, p. 46.

this animal and generally regard it with favor, although occasionally in its eager search for grubs it may uproot a plant, or do slight damage by eating a few berries. As white grubs commonly remain in the ground three years before emerging as mature beetles, each in this time can destroy much vegetation. They are quite secure from ordinary enemies. Except the crow, robin, and a few other species, birds find only those turned up in cultivation; the skunk, locating them by its sense of smell, digs them out of the ground.

Besides the larvæ, skunks eat also many mature "May beetles," or "June bugs."

SKUNKS AND THE HOP GRUB.

Hop growers in New York, Michigan, and elsewhere have serious losses from the depredations of the hop-plant borer, or hop grub. That the skunk is the only efficient natural enemy of this moth has been attested by nearly all entomologists who have written about the insect. The skunk is said to listen at the base of the hop vine, thus locating the larvæ at work. All hop growers value the skunk's services, and it was mainly through their efforts that legislation protecting this animal was first enacted in New York.

SKUNKS AND GRASSHOPPERS.

In July, August, and September, when grasshoppers are most abundant, they constitute the chief food of skunks, which consume enormous quantities. During the disastrous invasions of the Rocky Mountain locust in the plains country in 1873 and 1874 the skunk was reported as the principal mammal that destroyed these insects. As other species of grasshoppers are always abundant and sometimes extremely destructive to crops, the constant services of skunks in checking their increase should not be forgotten.

OTHER INSECTS EATEN BY SKUNKS.

Except a few Hymenoptera and predatory beetles, nearly all the insect food of skunks consists of kinds injurious to plant life. Among them are cutworms, cicadas, crickets, sphinx moths, and a beetle injurious to sweet potatoes in the South.

Skunks are among the few animals that prey on the Colorado potato beetle. Conway McMillan stated that "they consider the beetle a delicate morsel and spend many a busy evening in potato patches catching and eating the larvae and the mature beetles."¹

SKUNKS AND SMALL RODENTS.

Although other mammals, including coyotes, badgers, foxes, minks, and weasels, do far more good by destroying noxious rodents than is generally realized, the skunk surpasses them all. It is sufficiently

¹ Report Nebraska State Board of Agriculture, 1887, p. 280.

numerous in many localities to keep field mice in check, and reports from various parts of the country show that close trapping of skunks and other fur animals is often followed by an increase in depredations by mice. C. W. Douglas, nurseryman, of Waukegan, Ill., writing to the Biological Survey in 1906, attributed the abundance of meadow mice in that vicinity directly to the scarcity of skunks, weasels, and other natural enemies.

Besides meadow mice, skunks destroy also many other injurious native rodents, including white-footed mice, pocket mice, jumping mice, cotton rats, kangaroo rats, wood rats, chipmunks, and rabbits.

The skunk is especially useful in destroying the rats and mice that commonly infest farm buildings. It makes itself familiar about the premises when these rodents are abundant and preys upon them persistently. If not disturbed it will remain until all are destroyed.

The little spotted skunks are remarkably efficient as destroyers of rats and mice. They are small and nearly like a weasel in shape; they are quick in their movements, and can follow rats and mice into smaller crannies than the ordinary skunk can enter. In Kansas the writer once lived in a house with cellar openings on the outside. The dwelling had been unoccupied for a year and during this time the cellar had been used for storing corn, with the result that the entire house had become infested with rats and mice. A short time after the writer occupied the house it was noticed that a prairie spotted skunk had taken up its quarters in the cellar and night combats with rats were often heard. The skunk was frequently seen, but it was carefully left unmolested. After a few weeks the rats and mice had all been killed or driven away, and the skunk then left the premises.

There is much similar testimony to the usefulness of skunks as rat catchers. C. J. Maynard¹ says that the Florida spotted skunks are easily domesticated, and they are frequently used in houses for catching mice. Sometimes the animals are captured and the scent glands removed, but they are often simply decoyed about the premises by exposing food, when frequently they take up their abode beneath buildings and become so tame as to enter them in search of their prey.

UNDESERVED PREJUDICE AGAINST SKUNKS.

The early settlers of America were acquainted with the European fitchet weasel, and promptly applied its common name "polecat" to the skunk on account of its odor. The polecat of Europe is far more destructive to poultry and game than are skunks. Its bad reputation was transferred with the name, and circumstances have been unfavorable for a reversal of opinion. They feed mostly at night when their habits can not be observed, and few persons have undertaken to dissect their stomachs. The public are extremely slow to give up preju-

¹ Bull. Essex Inst., IV, 1872, p. 140.

dices of long standing, as those against hawks, owls, snakes, and skunks; consequently the usefulness of these animals has to be proved over and over before their needless and indiscriminate slaughter can be checked or adequate laws for their protection enacted.

Change of opinion about the value of skunks to agriculture has been very slow. Naturalists have generally given testimony favorable to the animals, but until recently their views were not reflected in legislation. Indeed, most of the laws for the protection of skunks have been passed because of a scarcity of furs and with the purpose of conserving a commercial resource.

PROTECTION OF SKUNKS.

The earliest legislation for the protection of skunks grew out of appeals from hop growers in New York. The legislature in 1893 having delegated to county boards of supervisors the right to enact local game laws, four counties in 1894 provided protection to skunks: Broome and Chenango Counties made a close season from March 1 to November 1; Onondaga County, from May 1 to November 1; Oswego County at first entirely prohibited the taking of skunks, except in a few towns and Oswego city, but in the following year it made an open season for skunks from November 1 to January 1. The State legislature began providing close seasons for skunks in various counties in 1896 and added others in succeeding years, until in 1906 the skunk law applied to 22 counties. Later the close season for skunks and other fur animals was made uniform for the entire State. The open season is now (1913) from November 1 to January 31, inclusive.

Ohio enacted a law in 1902 prohibiting the taking of skunks from February 1 to November 1, except when kept in inclosures for their fur or when doing injury on the premises of farmers. In 1913 the season for taking skunks was shortened and digging or smoking them from dens or destroying the dens was prohibited.

In West Virginia a general law passed in 1903 protects skunks throughout the year, provided that the law be first approved by a vote of the citizens in any county wishing to adopt it. Apparently this law is entirely inoperative, none of the counties having voted on its adoption.

In response to a general request from dealers in raw furs, the Michigan Legislature of 1899 passed a law forbidding the taking of all furs in September and October. It was not until 1909, however, that the skunk was specifically named as a protected fur animal in that State.

At the end of the year 1916 skunks were protected by close seasons in 20 States. The open seasons are as follows:¹

Maine and New Hampshire, November 1 to April 30; Vermont, October 20 to March 31; Rhode Island, November 1 to April 15; New York, November 10 to February 10; New Jersey, November 15 to April 1; Delaware, December 1 to March 10;

¹ Both dates given are included in the open season.

West Virginia, November 1 to December 31; Tennessee, noon, October 15, to noon, January 15 (three counties, September 1 to January 31); Kentucky, November 15 to December 31 (may be taken by dog or gun, October 1 to February 15); Ohio, November 15 to February 1; Indiana, Illinois, and Michigan, November 1 to March 31; Missouri, November 1 to January 31; Kansas, November 15 to March 14; Arkansas, October 1 to April 30 (act of 1917); Louisiana, November 1 to February 15.

Two counties of Wisconsin (Washington and Ozaukee) have open seasons for skunks, October 10 to February 1; the other counties have no close season. In North Carolina nine counties protect the skunk by close season.

Besides the close season, several of these States prohibit the digging of skunks from their dens or driving them out by the use of smoke or chemicals.

A close season of about nine months is well adapted to conditions existing in most parts of the country, where a reasonable period for fur taking is desired without encroaching on the season of breeding and growth of the animals. In parts of the country where skunks have been trapped to excess, a close season for a few years would probably restore their numbers.

COMMERCIAL VALUE OF SKUNKS.

The skunk stands second in importance among the fur animals of the United States, the total value of the annual catch being exceeded only in the case of the muskrat. The mink is third in value. Most of the skunk skins have been marketed in London, but their use is increasing in the United States and a percentage are now dressed and made up here.

No complete statistics of the London sales of skunk skins prior to 1858 are available. The total annual sales since that date are given in the following table. The statement includes skins of civet (the little spotted skunk), although in recent years these have been catalogued and sold separately.

TABLE I.—*Sale of skunk furs in London, 1858 to 1915.*

Year.	Number of skins.	Year.	Number of skins.	Year.	Number of skins.
1858.....	18,255	1878.....	285,103	1897.....	872,326
1859.....	84,886	1879.....	444,224	1898.....	482,130
1860.....	148,346	1880.....	517,191	1899.....	426,610
1861.....	116,609	1881.....	350,594	1900.....	695,688
1862.....	30,969	1882.....	443,911	1901.....	696,961
1863.....	94,187	1883.....	424,645	1902.....	973,695
1864.....	136,361	1884.....	596,243	1903.....	987,550
1865.....	103,755	1885.....	560,388	1904.....	911,923
1866.....	76,602	1886.....	489,473	1905.....	952,549
1867.....	137,407	1887.....	625,802	1906.....	1,225,582
1868.....	94,480	1888.....	526,263	1907.....	1,368,475
1869.....	111,001	1889.....	536,864	1908.....	1,037,641
1870.....	114,665	1890.....	688,946	1909.....	1,115,910
1871.....	45,670	1891.....	567,398	1910.....	1,282,001
1872.....	206,320	1892.....	635,800	1911.....	2,009,465
1873.....	263,704	1893.....	575,472	1912.....	1,821,485
1874.....	191,980	1894.....	739,228	1913.....	1,659,773
1875.....	243,493	1895.....	542,885	1914.....	1,921,869
1876.....	331,914	1896.....	796,750	1915.....	615,000
1877.....	283,141				

The present values of skunk skins in the raw-fur market (prices current in New York, February, 1917) are about as follows: No. 1,

\$2.50 to \$4.25; No. 2, \$1.50 to \$3.25; No. 3, \$0.75 to \$1.80; No. 4, \$0.35 to \$0.90. These quotations are slightly above the average of the last five years. Skunk fur is intrinsically of high value; the pelts are strong and the luster of the pelage is rich. This luster, however, decreases with long wear and exposure to sunlight.

Until recently skunk fur has not been popular at home. For many years almost the entire output was absorbed for European manufacture. The processes of deodorizing and dressing the skins in America have been improved greatly, and the fur is gaining steadily in popularity. The present extreme scarcity of Russian sable and other dark furs from abroad favors the market for skunk.

The oil of the skunk is used in some parts of the country for medicinal purposes. It is popularly believed to relieve rheumatism and various affections of the throat when applied externally. There is, however, no great demand for it.

The flesh of the skunk is sometimes used as food. It was formerly a common article of diet among North American Indians and trappers.

TRAPPING SKUNKS.

Trapping is the best method of taking skunks for their fur. Shooting spoils the pelt and generally results in its defilement by the animal. A moderate amount of trapping may be done each winter in many localities without seriously affecting the supply of this fur, and sometimes without greatly interfering with the beneficial work of the animals against farm pests. If no trapping were done skunks in some places might become noxious because of their abundance.

Skunks, being neither suspicious nor cunning, are easily trapped. They are often caught in unbaited traps placed in the paths they travel; yet the head of a fowl, a sparrow, or a dead mouse makes an excellent bait. Trappers use a medium-sized trap (No. 1) and try to take advantage of the peculiar habits and haunts of the animals, placing the trap in such places as the paths they travel to obtain water or near the openings to their dens. The trap should be set lightly (the trigger filed down to fit the notch loosely), and a little light trash (leaves or grass) may be scattered over it with advantage. The bait may be placed on the pan, or a little beyond the trap, or between two traps. The path may be narrowed artificially by setting upright sticks in two converging rows along it and the trap set in the narrow place.

Skunks when trapped do not often discharge their scent so as to defile the fur, but care is needed to remove them from the traps. With caution one may approach near enough to strike the animal a quick blow across the back, paralyzing the hind parts and preventing the discharge. Some trappers use a wire noose attached to a pole. The noose is cautiously lowered over the head of the skunk, and by a quick jerk the animal is lifted and strangled.

Many trappers use a tight box trap for taking skunks. When one is caught the box is carefully lifted and carried to water deep enough to cover it. If no water is available to drown the animal, it may be killed in the box by carbon bisulphid or chloroform.

RAISING SKUNKS FOR THEIR FUR.

Although skunks were often tamed and kept as pets or for destroying rats and mice, no attempt to raise them for their fur seems to have

been made until within the past 30 years. About 1885-86 there was a large foreign demand for the pelts and close trapping had led to a scarcity of black skunks. The feasibility of developing a strain of black animals by selective breeding came under consideration and many experiments in skunk farming were undertaken. Falling prices and other hindrances soon caused breeders to abandon their attempts. One firm in Pennsylvania claimed to have spent \$25,000 in lands and equipment in an unsuccessful venture in skunk raising.

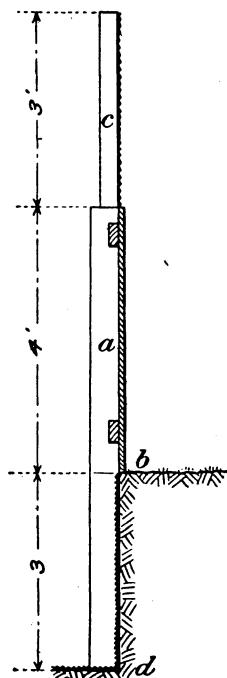
The high prices that have prevailed in the past few years have led to renewed discussion of the subject of skunk raising, and at present not a few persons are endeavoring to produce this fur in captivity. While some breeders have encountered difficulties, others have been quite successful. On the whole, there are excellent reasons for believing that a profitable industry may be developed. Skunks are less wild than most of the musteline family, and their miscellaneous diet permits a good deal of latitude in feeding, whereas the marten and the mink require a diet almost exclusively of meat. The problem of providing pens is also less complicated in the case of the skunk. The odor of the skunk may be entirely disregarded; but if the

FIG. 4.—Section of fence for skunk inclosure. *a*, Post 7 feet long; *b*, surface of ground; *c*, extension of post (2×4) to support netting or barbed wire strands; *d*, bottom of trench.

breeder prefers to do so, he may remove the scent glands and have his animals as harmless as cats. The popular belief that hydrophobia will result from a skunk bite is an error. There is no more danger from this source than there is in handling cats or dogs.

INCLOSURES AND DENS.

The skunk inclosure should occupy a well-drained, sandy hillside, partly shaded by trees, and partly open land, with grasses. An acre will afford room for about 50 adult skunks. It is desirable, but



not necessary, to have running water inside the inclosure. A 3-foot fence made of poultry netting and having an overhanging barrier at the top is sufficient to confine the animals. The barrier is needed, since the netting might serve as a ladder over which the skunks could climb. The netting should be of 1-inch mesh, as young skunks have been known to escape through meshes of $1\frac{1}{2}$ inches. The wire should be of No. 16 gauge.

This low fence, however, is not sufficient to keep out dogs or other intruders, unless the overhang is very wide and extends on both sides. Many breeders prefer a tight fence of boards or sheet iron or even a stone wall. A 4-foot fence of stout planks supplemented by a 3-foot netting or several strands of barbed wire above is recommended, as it may be made proof against the entrance of rats, and no overhang will be needed (fig. 4).

To prevent the skunks from digging out under the fence it should penetrate the ground to a depth of 2 or 3 feet. A layer of flat stones along the bottom of the trench on the inside is an additional precaution (fig. 5). Turning the netting in at the bottom is still another method of preventing escape. Unless the soil is loose skunks do little digging, but they have been known to dig under 3-foot walls.

Strong posts of good lumber are needed for outside fencing. They should be set at intervals of about 10 feet and should be well braced at corners. The overhang may be a wide horizontal board nailed to crosspieces at the tops of the posts, or it may be a strip of wire netting, sheet iron, or sheet tin a foot wide attached to wooden brackets or crossbars on the posts.

The skunk inclosure should be divided into smaller yards, the division fences being 3 or 4 feet high and made of netting ($1\frac{1}{2}$ -inch mesh) or of sheet iron. The compartments are convenient to separate different classes of animals, as males or skunks just weaned. Besides the general inclosure and its main divisions a separate breeding pen for each female should be provided. As these are to be used for only

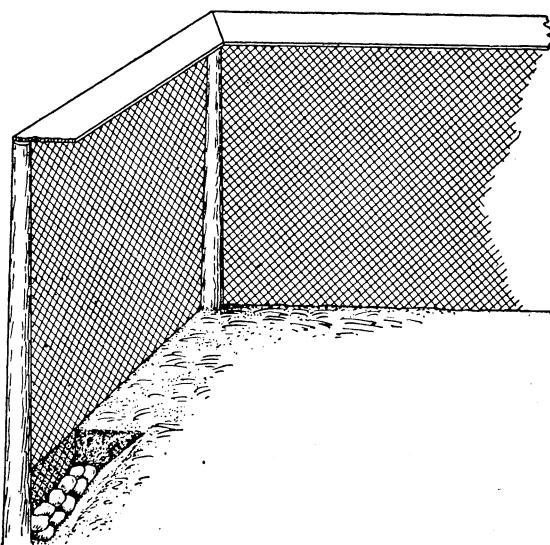


FIG. 5.—Detail of fence with board overhang, height 6 feet, showing stones in inside trench to prevent skunks from digging out.

two or three months at a time, cheap boxes with wooden floors will serve every purpose, but they must be dry inside. It will be advantageous to have each breeding den placed within a small run where the young skunks can exercise after they are large enough to leave the nest. This arrangement should entirely remove the danger of cannibalism in the skunk yard.

The general skunk inclosure and its main subdivisions should be provided with a sufficient number of dens to prevent overcrowding the animals. While in winter a number of skunks will den up together, they should not be compelled to do so at other times. The dens may consist of hollow logs, trenches covered with boards and earth, or artificial burrows bored in a sloping bank by means of a post auger. The skunks will enlarge these burrows to suit their needs. The chief requirement for all dens is that they shall be dry inside. Contact with the soil, unless it is wet, improves the fur.

FOODS AND FEEDING.

Skunks in captivity eat a great variety of foods, including meat, fish, insects, bread, cooked and even raw vegetables, and ripe fruits. Table scraps will keep the animals in good condition, but occasional meals wholly of raw meat are desirable. The meat should not be putrid nor very salty. More of it should be fed in the spring, for it is lack of meat diet that causes old skunks to eat the young.

Food for a large skunk ranch may often be procured from hotels or restaurants, when usually it will cost nothing but the labor of removing it. Arrangements may also be made with butchers for obtaining waste meat at low cost. If the ranch is favorably located, a supplemental diet of insects will be naturally available within the inclosure.

Cakes and mush made from cornmeal and bits of meat are excellent foods for skunks. If fresh milk is available, it may be made an important item in the diet. Cooked green corn and hominy also are recommended.

No more food should be given than will be eaten clean during the night. It is a mistake to place a dead animal inside the inclosure to provide food for a long time, or to give the animals occasionally a large supply of offal from a slaughterhouse and expect them to thrive and produce fine fur. But little more than the amount of food required for a cat will supply the wants of a skunk. The animals should be fed once or twice a day; if fed but once, it should be in the evening. Females with young should always be fed twice a day. Good fresh drinking water should be regularly provided, and vessels used for food or water should be kept clean.

BREEDING.

While skunks usually breed but once a year in captivity, occasionally a second litter is produced. One male should be kept for

five to eight females. The mating season is in February or early March. At this time it is best to keep the females and a single male in one run together. If two males are in the same small run they are likely to fight. The period of gestation is about nine weeks, the young coming in May. Before the young are born the females should be placed in separate breeding pens, which, as previously explained, may be a small run containing a den or nest box provided with nesting materials.

The young at first are blind and almost naked, but they grow rapidly and are weaned when about two months old. They should then be placed in a run set aside for young skunks. They are mature and have prime fur in December.

It is a fact recognized by most fur buyers that skunks raised in captivity usually have poor fur as compared with that produced by the wild animals. This is the result of keeping the animals in small pens or inclosures. If those intended for fur are turned into a large inclosure early in September and kept where they have ample exercise and can find some of their natural insect food, by the end of the year they develop as fine fur as is produced by wild skunks in the same locality.

About the end of this month breeding stock should be selected for the next season. Only good-sized dark skunks should be kept, the broad-striped and rusty-colored ones being killed for their fur or set at liberty. As far as possible the males kept for breeding should be black or "star" skunks. Careful selection year by year will result in a better grade of fur. According to the experience of several, it is possible in three or four generations to secure a strain of skunks the furs of which will all grade No. 1.

REMOVAL OF SCENT SACS.

Kept in pens secure from the intrusion of dogs and strangers, skunks will not be a source of annoyance to the neighborhood. The writer has visited a number of skunk ranches where no odor could be detected except inside the yards, and it was scarcely perceptible there. The animals soon become very tame and the keeper may handle them with impunity.

To transfer them from one run or pen to another, he lifts them by the tail, grasping this appendage by the heavy part rather than near the tip. However, as the animals are easily driven from place to place, they may be transferred without being handled. While it is not necessary to remove the scent sacs of skunks kept for fur, this is preferable if they are to be kept as household pets or as rat destroyers. Without the scent sacs they are far superior to cats as mousers.

The operation of removing the glands is attended with considerable danger to mature skunks, but it may safely be performed on the young. The best time is when they are from four to five weeks old.

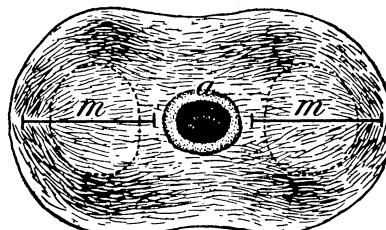
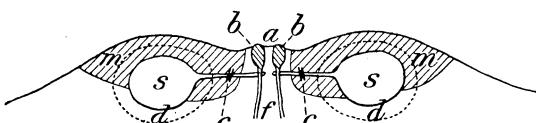


FIG. 6.—Diagram showing scent sacs of skunks (dotted lines). *a*, Anus and sphincter muscle; *m*, lines of incision to expose sacs and ducts.

as they should not be disturbed in the nests earlier. To remove the glands a short incision on each side through the skin and enveloping muscle is necessary (fig. 6). This exposes the round hard gland and the duct. Care should be taken not to cut the duct or other organs. When exposed, a clamping forceps should be placed over the duct close up to the gland (fig. 7). The gland is then cut out and the duct severed just beyond the clamp. The gland with clamp attached is then lifted out. No anesthetic need be used for this operation on a young skunk, but the older the animal the more difficult it will be because of the larger glands. In mature animals the sacs are nearly three-fourths inch in diameter.

During the operation the skunk is held between the knees of the operator by means of a gunny sack wrapped about its body and feet. Of course, an assistant is needed. The wounds should be brushed with a weak solution of carbolic acid and need no other dressing.

In his *Mammals of the Adirondacks*, Dr. C. Hart Merriam describes a less severe operation. It consists of cutting so as to expose a section of the duct leading from the gland and snipping out a short piece of it. In healing, the duct is permanently closed and the animal is powerless to use its musk.



OBTAINING SKUNKS FOR BREEDING.

FIG. 7.—Section through scent glands. *a*, Anus; *b*, sphincter muscle; *c*, position for clamps; *d*, muscle about scent sacs; *s*, scent sacs; *f*, rectum; *m*, depth (shaded area) of incision to be made. Care must be taken not to injure the sphincter nor to cut into the sac or duct. Length of ducts exaggerated.

As skunks inhabit most parts of the United States, they may usually be obtained in the neighborhood in which it is desired to breed them.

The best method is to dig the young out of dens in summer. In States providing a close season for skunks this could not be done without a permit from the authorities. If such permits are not granted, it would be necessary to capture adult animals in the open season. The assistance of local trappers might be helpful in obtaining stock. A box trap is best for capturing skunks alive. It is made like an ordinary rabbit trap and baited with a freshly killed mouse, a piece of meat, or a chicken head. When a skunk is caught, it may be carried to the inclosure before removal from the trap.

Skunks for breeding may be bought from trappers, dealers in wild animals, or other breeders. In some places express companies refuse to accept live skunks for shipment. However, there is no danger that the animals will use their scent if the box is dark inside and not subjected to rough handling.

HANDLING THE FUR.

In order that the breeder may realize the best prices for his product he must be acquainted with proper methods of handling and

marketing the pelts. For a time his surplus stock will command higher prices for breeding purposes than he could obtain for the skins, especially if the skunks are "deodorized," so that there is no difficulty in shipping them.

The best method of killing domesticated skunks for their fur is by suffocation. A tight wooden box large enough to hold several skunks and having a close-fitting door (padded if necessary) should be used. The animals may be driven into the box singly or several at a time. After the door is closed, a small quantity of carbon bisulphide or chloroform should be poured on a bunch of cotton and this introduced into the box through a hole in the top. The hole should be immediately corked or otherwise tightly closed. The amount of liquid needed will depend on the size of the box and the number of skunks. Two spoonfuls of either liquid is enough for one skunk in a small box, and not much more is required for several animals unless there is much extra space in the box. The animals die quickly and without struggle.

If illuminating gas is available it may be used instead of a volatile liquid. A rubber hose carrying the gas may be inserted through the hole in the box. The space about the tube may be plugged with cotton.

Skunk skins should be "cased" for market. The following directions for skinning should be observed:

Begin with the middle of the hind foot and with a sharp knife slit up the rear edge of the leg to the under side of the tail, being careful not to cut into the scent glands. Then cut the opposite leg in the same manner. No other cuts in the body of the animal are necessary. Cut around the heel of the feet and turn the skin back over the body. Strip the skin from the tail bone with the help of a split stick grasped in the hand while the thumb presses firmly against the back of the animal just above the tail. Continue to turn the skin back over the body, using the knife only when necessary to cut ligaments. Care should always be taken to cut around the nose, mouth, and eyes to avoid tearing the skin.

Some trappers slit the tail to remove the bone.

If the bone has been pulled out, the tip of the tail should be slit for about an inch to admit air, or a little salt or alum may be pushed down into the extreme tip.

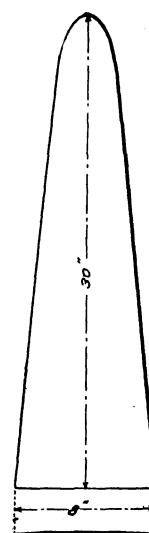


FIG. 8.—Diagram of stretcher made of thin board for drying skunk skins. (Dimensions in inches.)

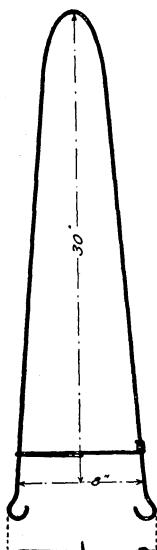


FIG. 9.—Diagram of stretcher similar to that shown in figure 8, but made of heavy galvanized wire.

The skin is left with the fur side turned in and dried on a stretcher made of a thin board sharpened to a point and of the shape and dimensions shown in figure 8. If the tail has been split open, the board should be long enough to permit the tail to be spread out and tacked fast. Several tacks are also needed to hold the rear end of the skin in good shape while drying.

Stretchers made of heavy galvanized wire (fig. 9) have many advantages over wooden ones and are now extensively used by trappers.

After the skin is on the stretcher all fat and flesh adhering to the pelt should be scraped off, and the drying should be done in the shade of a shed or tent where the air circulates freely—never by a fire nor in the sun. When thoroughly dry, it should be removed from the stretcher, when it is ready for market (fig. 10).

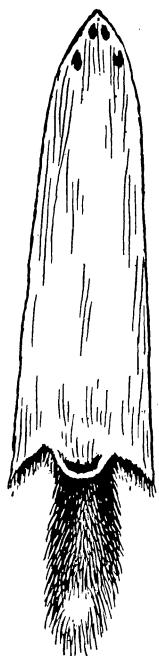


FIG. 10.—Skunk skin stretched and ready for market.

As a source of fur, skunks are an important asset to the country. They bring to the trappers of the United States about \$3,000,000 annually.

In view of their usefulness and fur value these animals should be protected everywhere by a close season of at least nine months, but the right of farmers to destroy predatory skunks should be reserved.

The propagation of skunks for their fur promises to develop into an important industry. It is at least a matter of sufficient importance to warrant the most careful investigation, and experiments in breeding the animals should be generally encouraged.

